

**Amendments to the Drawings:**

The attached sheet of drawings include changes to FIG. 3.

In amended FIG. 3, reference character "C" has been changed to --F-- to designate the extraction area in accordance with the disclosure and FIG. 1. This sheet depicting FIG. 3 replaces the original sheet depicting FIG. 3.

Attachment: One (1) Replacement Sheet

REMARKS/ARGUMENTS

The claims are 3-12. Claims 1 and 2 have been canceled in favor of new claim 12 to better define the invention. Accordingly, claims 3, 5 and 7, which previously depended on claim 1, have been amended to depend on new claim 12. In addition, claim 4 has been amended to depend on claim 3. These claims and claims 6 and 8-11 have also been amended to improve their form or to delete reference numerals. In amended FIG. 3, the reference character "C" has been changed to --F-- to designate the extraction area, and the specification has been amended to refer to valve piston "V" and ground layers "B". Support for the amendments may be found, *inter alia*, in original claims 1 and 8, and FIG. 1. Reconsideration is expressly requested.

The drawings were objected to under 37 CFR 1.84(p)(5) as including the reference characters: "B", "V", and "C", which were not mentioned in the description. In response, Applicants have amended the specification to refer to the ground layers "B" and the valve piston "V" and have amended FIG. 3 to change the references character "C" to --F-- as it is given in FIG. 1. It is respectfully submitted that the foregoing amendments overcome the Examiner's objection to the drawings under 37 CFR 1.84(p)(5),

and Applicants respectfully request that the objection on that basis be withdrawn.

Claims 1-6 were rejected under 35 U.S.C. 112, second paragraph, as being indefinite for the reasons set forth on page 3 of the Office Action. In response, Applicants have canceled claims 1-2 in favor of new claim 12 and have amended claims 3-11 to improve their form. It is respectfully submitted that all currently pending claims fully comply with 35 U.S.C. 112, second paragraph.

Claims 1-4, 7 and 9 were rejected under 35 U.S.C. 102(a) as being anticipated by *Troutt et al. U.S. Patent Application Publication No. 2002/0153135*. The remaining claims were rejected under 35 U.S.C. 103(a) as being unpatentable over *Troutt et al.* in view of *Thomas et al. U.S. Patent No. 6,427,774* (claims 5, 6, 10 and 11) or *Prain et al. U.S. Patent Application Publication No. 2004/0069530* (claim 8). Essentially, the Examiner's position was that *Troutt et al.* discloses the method and apparatus recited in the claims except for features which were said to be taught by the secondary references to *Thomas et al.* and *Prain et al.*.

This rejection is respectfully traversed.

As set forth in new claim 12 and claim 7 as amended, Applicants' invention provides a method for intensifying permeability of ground layers close to boreholes and of filter bodies and filter layers in an underground extraction area of water wells and other production wells and a device for carrying out this method.

As recited in new claim 12, liquid in an extraction area of a borehole is continuously pumped away by an underground pump. A pulse generator is continuously moved up and down in the extraction area to cause energy pulses generated by a surface pressure unit that is connected in leak-proof manner via a pressure line with the pulse generator moved in the extraction area.

The pressure line introduces a pressure line liquid in the pulse generator, and the pressure unit exerts a high pressure on the pressure line liquid as a hydraulic pulse at a defined pressure and for a defined duration out of the pulse generator into the liquid to be extracted to successively impinge the liquid toward borehole walls and filter bodies and filter layers in the underground extraction area.

Seismic measurements are used to obtain a respective

evaluation of an effect of each energy pulse, and parameters of a following energy pulse are determined according to the evaluation of a previous energy pulse.

In this way, Applicants' invention provides a method and device for intensifying the permeability of ground layers close to boreholes and of filter bodies and filter layers in water wells and other production wells, which makes it possible to intensify the permeability of ground layers close to boreholes and of filter bodies and filter layers more efficiently than is possible with prior methods and devices and without risk of destroying the borehole and its lining.

None of the cited references discloses or suggests a method for intensifying the permeability of ground layers close to boreholes and of filter bodies and filter layers in an underground extraction area of water wells and other production wells or a device for carrying out that method wherein a pulse generator is continuously moved up and down in the extraction area to cause energy pulses generated by a surface pressure unit, with the pressure unit exerting a high pressure on the pressure line liquid introduced in the pulse generator as a hydraulic pulse at a defined pressure and for a device duration out of the pulse generator into the liquid to be extracted to successively

impinge the liquid toward borehole walls and filter bodies and filter layers in the underground extraction area.

*Troutt et al.* simply describes a method for intensifying the permeability of boreholes by abruptly increasing the pressure of the water volume in a certain zone of the borehole limited by agitating disks (100 and 102). The abrupt increase of the pressure is caused by a sudden exhaust of a pressurized gas into the limited water volume. It is respectfully submitted that *Troutt et al.*'s method has nothing to do with Applicants' method and device which do not use any pressure increase in a limited volume. Rather, contrary to *Troutt et al.*, Applicants' method and device direct hydraulic energy pulses sent from the pulse generator in the direction to the wall of the borehole. Accordingly, it is respectfully submitted that *Troutt et al.* cannot anticipate Applicants' method and device as recited in new claim 12 and claim 7 as amended.

The defects and deficiencies of the primary reference to *Troutt et al.* are nowhere remedied by the secondary references to *Thomas et al.* and *Prain et al.* *Thomas et al.* simply discloses a process and apparatus for coupled electromagnetic and acoustic stimulation of crude oil reservoirs using pulsed power electrohydraulic and electromagnetic discharge. There is no

disclosure or suggestion in *Thomas et al.* of a method wherein a pulse generator is continuously moved up and down in an extraction area to cause energy pulses generated by a surface press unit that is connected in a leak-proof manner via a pressure line with the pulse generator moved in the extraction area, the pressure line introducing a pressure line liquid in the pulse generator and the pressure unit exerting a high pressure on the pressure line liquid as a hydraulic pulse at a defined pressure and for a defined duration out of the pulse generator into the liquid to be extracted to successively impinge the liquid toward borehole walls and filter bodies and filter layers in the underground extraction area. In contrast to *Thomas et al.*, Applicants' method and device does not use electromagnetic pulses or acoustic pulses which are caused by plasma vaporization, and therefore even if one were to combine *Thomas et al.* with *Troutt et al.* as suggested by the Examiner, one would still not achieve Applicants' method and device as recited in new claim 12, and claim 7 as amended.

The remaining reference to *Prain et al.* has been considered, but is believed to be no more relevant. *Prain et al.* simply describes drilling operations without any connection to the problem to which Applicants' invention as recited in the

claims is directed, namely intensifying wells and other production holes. Therefore, one skilled in the art would have no reason to make the combination of *Prain et al.* with *Trott et al.* as suggested by the Examiner. Moreover, even if the combination were to be made one would still not achieve Applicants' method as recited in new claim 12 or the device for carrying out that method as recited in claim 7 as amended.

Accordingly, it is respectfully submitted that the claims are patentable over the cited references.

In summary, claims 1-2 have been canceled, claims 3-11 have been amended, and new claim 12 has been added. The specification and FIG. 3 of the drawings have also been amended. In view of the foregoing, it is respectfully requested that the claims be allowed and that this case be passed to issue.

Respectfully submitted,  
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Enclosure: Appendix - 1 replacement sheet of drawings

I hereby certify that this correspondence is being deposited with the U.S. Postal Service as first class mail in an envelope addressed to: Commissioner of Patents, P.O. Box 1450, Alexandria, VA 22313-1450 on September 11, 2007.

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# APPENDIX